# The Conical Monopole

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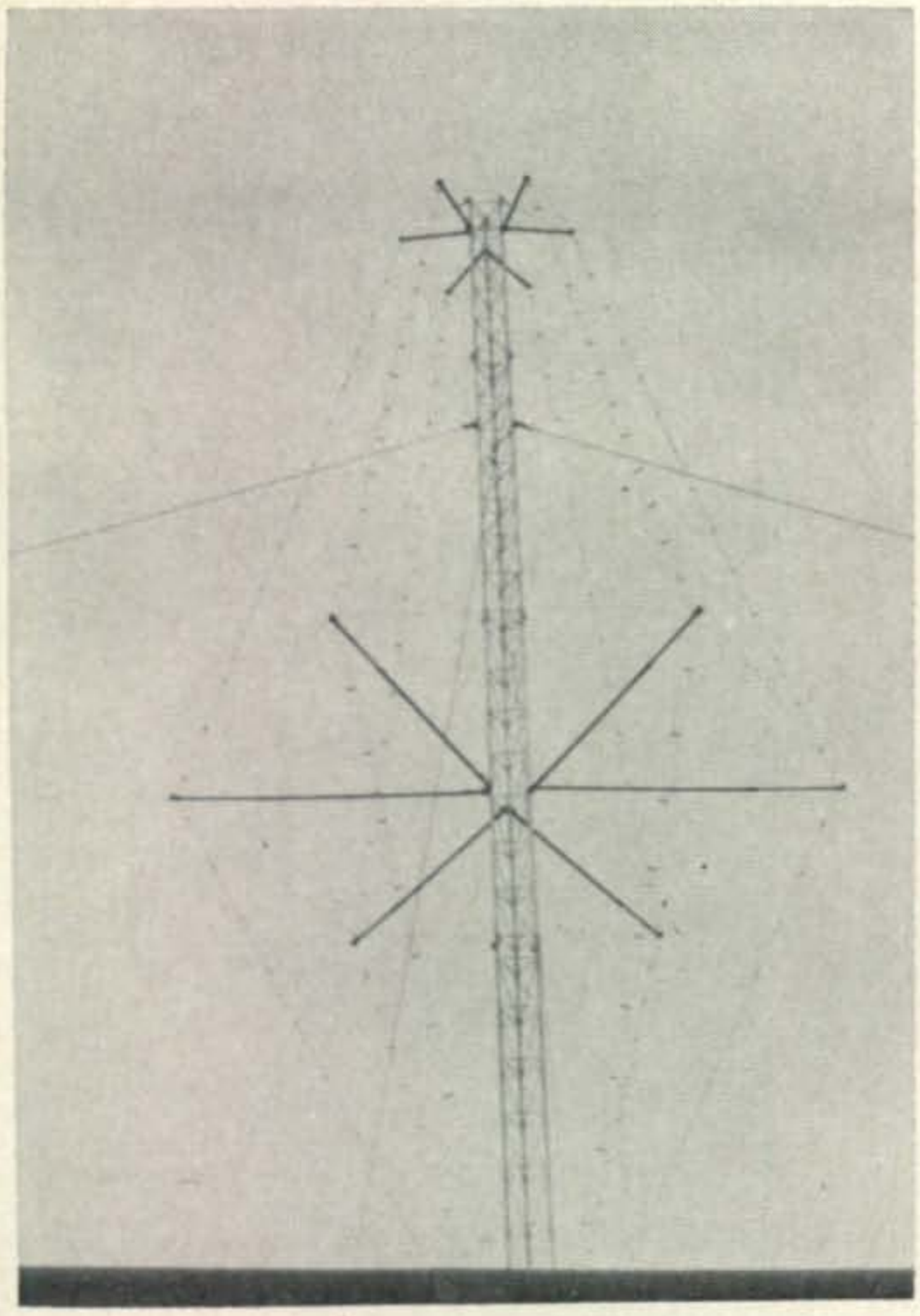
*This vertical type antenna has a 4 db gain, a wide bandwidth and is very suitable for backyard installations.*



View of a 43 foot tall long haul military installation mounted atop a building. Note the use of spacers to keep the pairs parallel.

THIS is it! Down through the years many antennas have been introduced to the amateur as the answer to his problems. This antenna, I feel comes closer to being a true answer to the general requirements of the amateur than any antenna henceforth proclaimed. Multi-band antennas are a poor to fair compromise, at best, of an amateur's desires, needs, available space and cost versus performance. This bomb of an antenna gives a continuous bandwidth of 4:1, less than 2.5:1 s.w.r. over the *entire* bandwidth, coaxial feed, a nice 4 db gain and good old DX low angle radiation. If you are tired of pruning and tuning, raising and lowering, limited in space and getting burned by old man s.w.r. for using your 75 meter dipole to meet MARS nets, then you are ripe for the Conical Monopole. This little gem is patented, sad to report, so build accordingly.

I am sold on this antenna. I took some antennas, similar to the one in the photo on top of the building, several Collins KWM-2A's and other gear and a team of operators to the Dominican Republic and they outperformed log periodiocs, rhombics, inverted Vee's, and whips so much of the time that I was swamped with wheels wanting phone patches to the USA. It does a mere Lieutenant's heart good to see full Colonels standing in line to use his KWM-2A's! I was sold on the Conical Monopole before this, but brother, that did it!

### Construction

On the 43 foot antenna you almost have to use three-cornered tower. If it can be gotten as big as 12" or 14" across and imbedded in concrete to be self supporting, then so much the better. On the 23 foot and 12 foot high antennas, 2" or 3" pipe can be used, and also imbedded in concrete to be self supporting.

The cross arms are best made from one inch conduit or larger. The three cross-arms are bolted to the sides of the tower so that there are, in effect, six arms out from the tower at sixty degree intervals. This is done top and bottom, with the top and bottom arms being aligned. Each cross arm has a wire on each side of it, spaced 1", 2" or 3" as per the chart in fig. 1. These 12 wires are tied to the top of the mast, run to the tip of the small cross arm, down to the side of the tip of the large cross arm and toward the base of the mast. There at the base and *only* there are they insulated by a strain insulator or another suitable type. All of these wires are tied together just above the insulator by a ring of wire and the center of the coaxial cable is connected to it.

The spacing of 1", 2", or 3" should be maintained the entire length of the 6 pairs of wires. Spacers are used on the larger antennas to keep the vertical wires from twisting. When they do twist, it seems to make a "blind spot" and upset the s.w.r. At every point where the vertical wires touch a cross-arm or the mast, except the base, they are *solidly grounded!* "Grounded?", a skeptic mumbles, "How does it work that way?" All I can say is, that it works *fine*. The cross arms are solidly grounded to the mast and the mast is solidly grounded to a good earth ground or a good counterpoise. This is important.

The ends of all six cross-arms are tied to-

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gether with a wire that forms a six sided circle when looking down from the top. This is done to the top and bottom arms and they are called Peripheral radiators. These, too, are solidly grounded to the ends of the crossarms.

On the small antenna, you might get satisfactory operation by using one wire per arm. For those who must build with newly purchased material, it would be worth a try. If it doesn't work out the second wire can be added with little trouble.

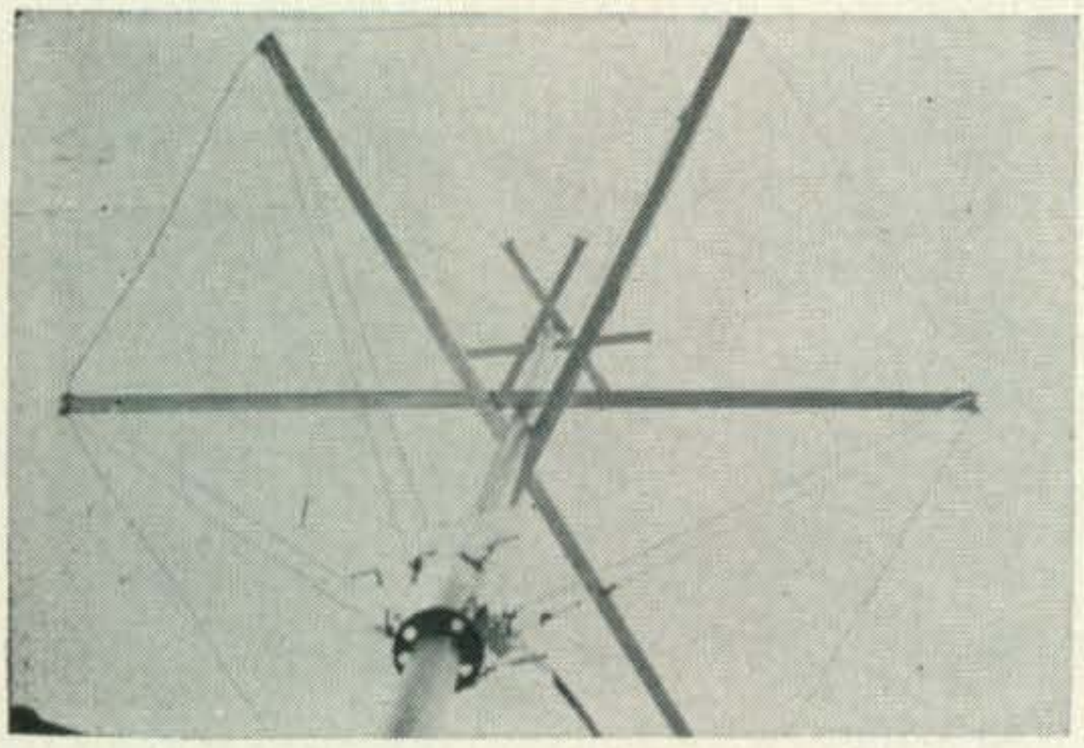
These antennas can be mounted on buildings, and the smaller ones seem to work a little better higher off the ground as long as they are well grounded wth a good counterpoise. If guy wires are needed, they should be insulated or ropes should be used. Existing wooden poles can be used to construct Conicals, just run three or four heavy wires down the length of the pole and tie them to the cross arms securely and ground them at the base. The pictures tell more than a book of descriptions can, and the 96 foot antenna figures were included in case someone wanted a whopping signal on 160 meters. One fellow has a 23 foot Conical and has a knife switch and a loading coil and an insulator in the base of the antenna so that a throw of the switch makes his "40 thru 10" do double duty on 75, with good results, too.

## Operation

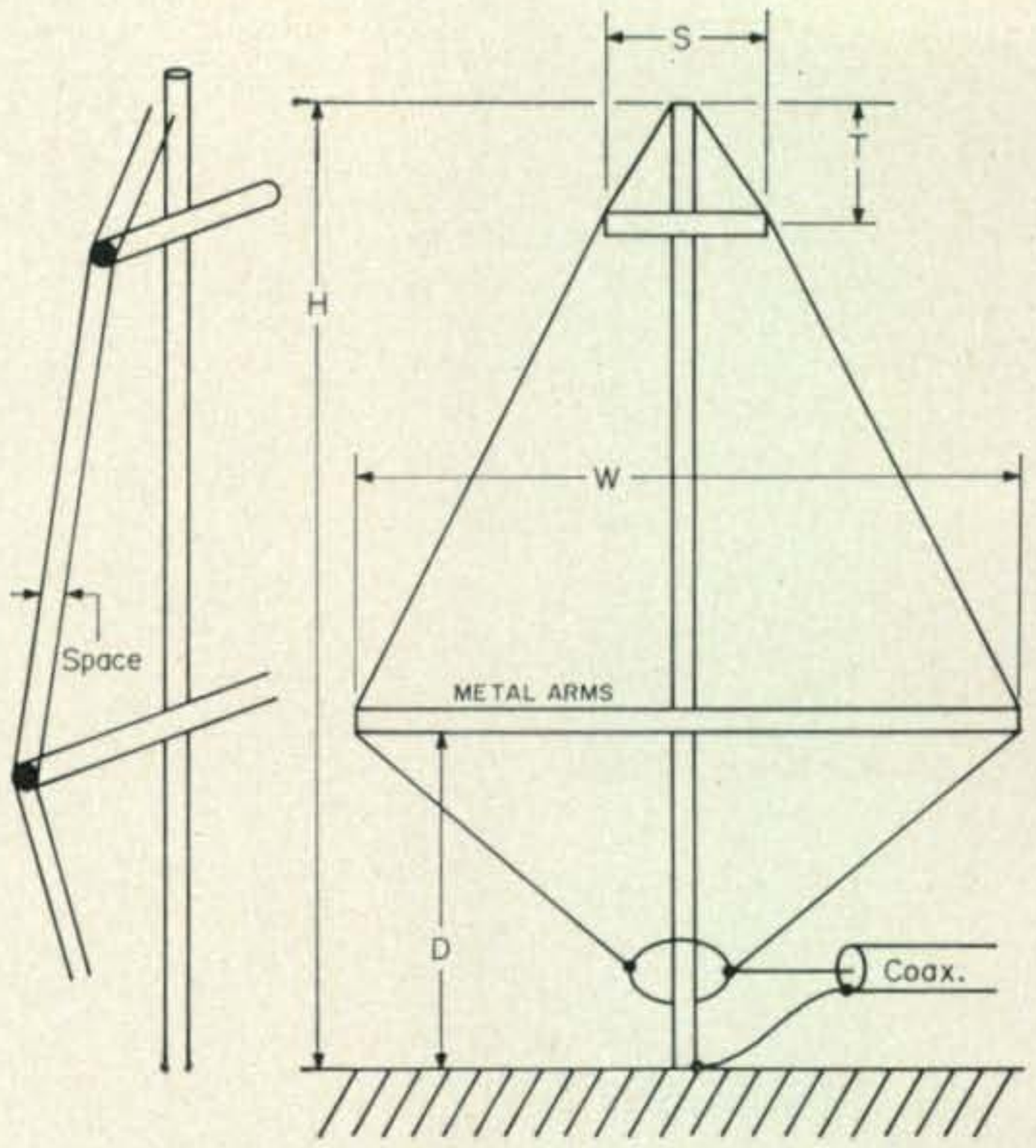
Be very careful to dip your rig on the fundamental and not on an harmonic, for this antenna will accept it and radiate it very effciently. Its wide bandwidth requires that your rig be fairly free of spurious signals, but TVI has been no problem so far with me. I found a tunable, calibrated field strength meter a very handy and cheap means of avoiding loading out on harmonics.

You can mount clearance lights or small antennas, not to exceed ten percent of the Conical's height, on top of the Conical Monopole without altering its performance. Just run the lines inside the poles or towers.

When I built my 12 foot Conical, it brought my receiver to life as it had never been livened



Inside view of the 12 foot amateur version of the Conical Monopole.




| Freq. Range | H | W | D | T | S | Space | WIRE SIZE |
|---|---|---|---|---|---|---|---|
| 3.5 - 15mc | 43' | 17' 8" | 16' 10" | 26" | 5' 10" | 3" | #8 |
| 7 - 28mc | 23' | 9' 6" | 9' | 12" | 38" | 2" | #10 |
| 14 - 56mc | 12' | 5' | 4' 9" | 8" | 20" | 1" | #12 |
| 1.8 - 7.3mc | 96' | 39' | 37' | 4' 9" | 13' | 9" | #14 |

Fig. 1—Construction data and dimensions for the Conical Monopole antenna. The measurements are given for four overlapping frequency ranges. Construction details are given in the text. Figures for 1.8 to 7.3 mc are given on the offhand chance that someone might want to use this on 160.

up before. The frequencies above 16 mc were brought to an unprecedented high activity level, or so it seemed. I had always thought that above 16 or 18 mc the spectrum was dead except for ham bands and an occasional VOA or RTTY station. On 20 meters, I heard stations 5/9 that previously I could only hear east coast stations calling. On 20 c.w., I knocked off an F8, PY2, DJ1, KZ5, LU6, and others not so far off. So what? I was using a rock bound five watt rig, that's what! This may be due to my present location being very poor in that there is no usable skip into W6 land! A friend ten miles away hears nothing but W6 land, but he doesn't have a Conical Monopole antenna, yet! One Saturday on 15 meter s.s.b. I could have gotten half of a WAC, but I'm never stationed in one place long enough to get it so I didn't try them.

This antenna may be just shy of the performance you could get from a good, well made, expensive tri-bander beam, but the cost differential and all the extra frequency range thrown in doesn't hurt me in the least. I rather enjoy digging out my old Heath CB'er and simply hooking it up to this antenna to check out my mobile friends every now and then. The 12 and 23 foot antennas are real good for CB, even if you just want to listen. Marconi, I hope this antenna increases your *convenience and pleasure as much* as it did mine. ■